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09/915,417	07/27/2001	William J. Allen	60980079-2	7018

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EXAMINER

LEE, TOMMY D

ART UNIT PAPER NUMBER

2625

DATE MAILED: 04/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/915,417

Applicant(s)

ALLEN ET AL.

Examiner

Thomas D. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-8 and 13-18 is/are allowed.
- 6) ☒ Claim(s) 1, 9, 10, 12, 19, 20 and 22-27 is/are rejected.
- 7) ☒ Claim(s) 11 and 21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office action is responsive to applicant's amendment filed January 13, 2006. Claims 1 and 3-27 are pending.

Response to Arguments

2. Applicant's arguments, see page 13 of the current amendment, filed January 13, 2006, with respect to the rejection of claims 17, 23, 25 and 26 under 35 U.S.C. 112, second paragraph, as set forth in the prior Office action, have been fully considered and are persuasive. The rejection of these claims has been withdrawn.

3. Applicant's arguments, see page 13 of the current amendment, with respect to the rejection(s) of claim(s) 1 and 3-27 under 35 U.S.C. 102(e) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of U.S. Patent 6,643,032 (Crean et al.).

Claim Rejections - 35 USC § 102

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
5. Claims 1, 9, 12, 19 and 22-27 are rejected under 35 U.S.C. 102(e) as being anticipated by Crean et al.

Regarding claims 1 and 12, Crean et al., whose filing date of December 28, 1998 predates the effective filing date (March 7, 2000) of previously cited U.S. Patent 6,831,756 (Ushiroda), which was overcome by applicant's Declaration filed along with

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the current amendment, disclose a method of generating halftone threshold matrix data for an image printer, said method comprising the steps of: taking a stored high bit content halftone matrix data (halftone cell produced by high addressable raster output scanner (Fig. 2), capable of producing 64 levels (6 bits) (column 3, lines 50-55)); reducing said high bit content halftone matrix data to a relatively lower bit content halftone matrix data, within said image printer, wherein said step of reduction comprises incorporating a printer response correction function into said relatively low bit content halftone matrix data (tone reproduction curve created on the basis of reflectivity or darkness of measured calibration samples using halftone cell (column 4, lines 44-62); halftone cell capable of 16 levels (4 bits) of output produced (Fig. 5), such that each input level corresponds to a uniform, appreciable change in measured darkness (column 4, lines 29-43; column 4, line 63 – column 5, line 29)). Crean et al. further disclose a computer readable storage medium on which is embedded one or more computer programs, said one or more computer programs implementing the above method (invention can be practiced by software implementations of the halftoning process (column 6, lines 13-17)).

Regarding claims 9 and 19, Crean et al. disclose a method of applying a correction to image data to correct for a printer response characteristic; said method comprising the steps of: generating a correction characteristic to correct for said printer response characteristic, wherein said printer response characteristic is based on a response characteristic of a printer device (tone reproduction curve created on the basis of reflectivity or darkness of measured calibration samples using halftone cell (column 4,

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lines 44-62)); applying said correction characteristic to a relatively high bit content halftone matrix data, to obtain a relatively low bit content halftone matrix data corrected for said printer response characteristic (correction applied to 64-level halftone cell (Fig. 2) to produce 16-level halftone cell (Fig. 5), such that each input level corresponds to a uniform, appreciable change in measured darkness (column 4, lines 29-43; column 4, line 63 – column 5, line 29)); and processing said image data using said relatively low bit content halftone matrix data (image data processed on the basis of 16-level halftone cell stored in DRAM, laser data driving a raster output scanner and illuminating subpixels on output medium (column 5, lines 30-57)). Crean et al. further disclose a computer readable storage medium on which is embedded one or more computer programs, said one or more computer programs implementing the above method (invention can be practiced by software implementations of the halftoning process (column 6, lines 13-17)).

Regarding claims 22-26, Crean et al. disclose an image printer system configured to generate a linearized halftone matrix for a printer, said printer system comprising: a linearization function (tone reproduction curve used to improve linearization of printer (column 5, lines 40-45)); a high bit halftone matrix (64-level halftone cell (Fig. 2)); and a processor configured to compile a linearized halftone matrix based on said linearization function and said high bit halftone matrix (correction applied to 64-level halftone cell to produce 16-level halftone cell (Fig. 5), such that each input level corresponds to a uniform, appreciable change in measured darkness (column 4, lines 29-43; column 4, line 63 – column 5, line 29)). The system further comprises: a

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target response (uniform change in observed darkness per incremental increase in input level illustrated by tone reproduction curve and table shown in Fig. 6B); and an actual response, wherein said processor is further configured to calculate said linearization function based on said target response and said actual response (tone reproduction curve shown in Fig. 3 corresponds to actual response, additional calibration elements produced between elements producing large percentage change in measured darkness, so as to produce uniform change in observed darkness per incremental increase in input level (column 4, line 63 – column 5, line 29)). Said printer is configured to print a calibration patch (calibration sample produced by programming a printer to produce calibration elements corresponding to differing numbers of subpixels (column 4, lines 47-50)). Said processor is further configured to determine said actual response based on said calibration patch (based on tone reproduction curve constructed using the printed calibration sample, additional calibration elements produced between elements producing large percentage change in measured darkness, so as to produce uniform change in observed darkness per incremental increase in input level (column 4, line 63 – column 5, line 29)). Said printer is further configured to print an image based on said linearized halftone matrix and data associated with an image (laser data driving a raster output scanner and illuminating subpixels on output medium (column 5, lines 30-57)).

Regarding claim 27, Crean et al. disclose an image printer configured to generate a halftone threshold matrix, said printer comprising: a means for taking a stored high bit content halftone matrix data (halftone cell produced by high addressable raster output scanner (Fig. 2), capable of producing 64 levels (6 bits) (column 3, lines

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50-55)); and a means for reducing said high bit content halftone matrix data to a relatively lower bit content halftone matrix data, within said printer, wherein said step of reduction comprises incorporating a printer response correction function into said relatively low bit content halftone matrix data (tone reproduction curve created on the basis of reflectivity or darkness of measured calibration samples using halftone cell (column 4, lines 44-62); halftone cell capable of 16 levels (4 bits) of output produced (Fig. 5), such that each input level corresponds to a uniform, appreciable change in measured darkness (column 4, lines 29-43; column 4, line 63 – column 5, line 29)).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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8. Claims 10 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crean et al.

Crean et al. are silent as to whether the generation of a correction characteristic by said printer device is carried out *automatically*. However, as one of ordinary skill in the art would have recognized, automatic correction of characteristics of a printer is well known and highly desirable, in that automatic correction by the printer eliminates the need for a user to perform any additional steps in order to operate the printer, and eliminates any possibility of errors being introduced because of manual operation. Therefore, carrying out the generation of the correction characteristic automatically would have been an obvious modification of Crean et al., to one of ordinary skill in the art.

Allowable Subject Matter

9. Claims 3-8 and 13-18 are allowed.

10. Claims 11 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter: As Ushiroda has been removed as a prior art reference, no other reference has been found to disclose or suggest the combined steps of storing data describing a plurality of data elements as a plurality of vector entries; storing a tone correction data as a list of numbers; sequencing through said list of numbers and for each said number of said list, assigning a halftone level to a corresponding number of said vector entries;

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and generating a lower bit content per element two dimensional halftone threshold level matrix from said plurality of vector entries and their corresponding respective assigned halftone threshold levels, as recited in base claims 3 and 13; or the combined steps of converting higher bit content threshold level data into at least one level vector, applying a tone correction function; selecting said number of vector data entries from said plurality of vector data entries from said plurality of vector data entries in said level vector; and transforming said plurality of selected vector data into a lower bit content two dimensional threshold data, as recited in base claims 5 and 15; or wherein said correction characteristic is generated dynamically, and applied to said relatively high bit content halftone matrix in vector format, as recited in dependent claims 11 and 21.

Conclusion

12. In view of new grounds for rejection not necessitated by amendment, this Office action is non-final.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas D. Lee whose telephone number is (571) 272-7436. The examiner can normally be reached on Monday-Friday, 7:30-5:00, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on (571) 272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thomas D Lee
Primary Examiner
Technology Division 2625

tdl
April 13, 2006